Chapter 5
The Case of East Germany

5.1 The Re-emergence of Entrepreneurship as a Key Element of the Transformation to a Market Economy

The fall of the Berlin Wall in November 1989 marked the beginning of a transformation of the former socialist regimes of Eastern Europe to a market economic system. The re-emergence of private entrepreneurship—strongly suppressed in the planned socialist economies—is a key element of this development. The transition to a market economy increased the number of entrepreneurial opportunities tremendously and entrepreneurs have been crucial agents of change throughout this process.

The surge in start-up activities after the "rules of the game" had changed, vividly illustrates what was put forward by William Baumol (1990); the allocation of talent into productive entrepreneurship is strongly determined by the institutional framework. A considerable amount of literature on entrepreneurship in a transitional context has emerged that stresses the important role of institutions and institutional change for the emergence and the performance of new firms (for an overview, see Kshetri 2009).[1] Indeed, the transition of former socialist countries of Eastern Europe is a fascinating empirical arena for studying and understanding the important interplay between institutions and entrepreneurship.

In this chapter we analyze the emergence of new business formation and entrepreneurship during East Germany's transformation from a socialist system to a western-type market economy. Our main interest lies in discovering the effect the legacy of a socialist system had on entrepreneurship in the successive periods. In contrast to other transition countries, the case of East Germany has some attractive

This chapter builds on Fritsch et al. (2014).

[1]E.g., Brezinski and Fritsch (1995), Johnson and Loveman (1995), Smallbone and Welter (2001, 2009), McMillan and Woodruff (2002).

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features that create quasi-natural lab conditions for studying the role that (exogenous) institutional change had on entrepreneurship.

East Germany is particularly well-suited for an analysis of the institutional legacy of socialism for at least two reasons. First, with the reunification of Germany in 1990, the ready-made West German framework of formal institutions was adopted practically overnight. As a result of this, entrepreneurship in East Germany could build on the approved institutions of a successful western-type market economy from its beginning. This quasi-natural experiment of a clear-cut exogenous institutional shock rules out endogeneity that may be caused by the mutually reinforcing interplay of emerging entrepreneurship and institutional change that is typical for other transition economies. Hence, our results for the case of East Germany may be regarded as particularly reliable since we are not faced with the problem of disentangling empirically whether institutional change affects entrepreneurship, or whether entrepreneurship affects institutional change (reverse-causality problem). Second, comparisons of development in East Germany and West Germany provide a suitable benchmark for identifying special features of entrepreneurship that may be regarded as an outcome of a socialist legacy or a "treatment effect" of exposure to a socialist system.

These two features of the East German case make it well suited to test Baumol's (1990) claim that the level of potential entrepreneurs is approximately the same in all societies, but the proportion of those people who make productive use of their talent by running their own business depends on the ruling institutions. Hence, considering self-employment to be a form of productive entrepreneurship in the sense of Baumol's (1990) hypothesis, we should expect a convergence of both the level and the type of self-employment between East and West Germany.

However, we go considerably beyond such a simple test of Baumol's (1990) hypothesis in a number of respects. One of these extensions is to analyze the characteristics of entrepreneurs in the two parts of the country. If individual characteristics of entrepreneurs and non-entrepreneurs reflect incentives of the institutional framework for becoming self-employed, then these characteristics in East and West Germany should not be too different. The differences that we find between East and West German entrepreneurs may be regarded as a legacy of the socialist regime. A second extension is the inclusion of informal institutions in the analysis.[2] This is possible by investigating differences across East German regions and accounting for historical levels of entrepreneurship in pre-socialist times. We regard such historical levels of entrepreneurship as indicators for a regional entrepreneurship culture and analyze how such a regional culture affects the levels of new business formation and self-employment in the post-socialist transition period. If we find correspondence between historical and current levels of regional entrepreneurship, this suggests that such a culture could not be eradicated by four decades of anti-entrepreneurial socialist formal institutions. Such a result could be regarded as a confirmation of

[2]Baumol (1990) seems to recognize the role of informal institutions by mentioning the low social prestige of entrepreneurship in ancient Rome.

the hypothesis that informal institutions change much more slowly and are more persistent than formal rules (North 1994; Williamson 2000). The analysis shows to what extent the informal institution of a regional entrepreneurship culture leaves an imprint on entrepreneurship and is able to survive radical changes of the governing formal systems.

In the next section (Sect. 5.2), we first provide a brief sketch of the historical background by portraying the state of entrepreneurship in East Germany during the socialist regime. Section 5.3 then describes the development of the overall level of self-employment in East Germany after unification and the regime switch to a market economy. Based on the overall picture, we then offer a comparative analysis of the individual characteristics of business founders and self-employed people in East Germany and West Germany (Sect. 5.4). The main aim of this analysis is to identify to what extent four decades of socialist treatment in East Germany has left its imprint on an individual's attitude about entrepreneurship. Section 5.5 deals with regional differences and long-term trends of regional levels of self-employment. In particular, we relate current levels of entrepreneurship to the level of self-employment before and during the socialist period in order to identify persistence. We regard persistence as the manifestation of an informal institution of a regional entrepreneurship culture. Finally, we draw conclusions and suggest some promising and important avenues for further research (Sect. 5.6).

5.2 Historical Background

After the devastating defeat of World War II, Germany was occupied by the Allied Powers. In 1949, the eastern part of the country, which was under the control of the Soviet army, became the German Democratic Republic (GDR); a socialist state with a centrally-planned economic system. The western part of Germany became the Federal Republic of Germany (FRG) with a western-type market economy. After about 40 years, East Germany was reunified with the West after the socialist East German state collapsed in late 1989. This reunification gave the former GDR membership in the European Union and the introduction of the West German market economic system.

The socialist GDR regime strongly favored collectivist values and perceived entrepreneurship as a bourgeois anachronism (e.g., Pickel 1992; Thomas 1996). Hence, the socialist government adopted a rigorous anti-entrepreneurship strategy that made numerous attempts to eradicate entrepreneurship and private-sector firms. This included massive socialization of private enterprises and intensive control of the few remaining private-sector activities that were officially tolerated (for details, see Brezinski 1987; Pickel 1992). However, even in light of the GDR's massive anti-entrepreneurship policy, 1.8% of the population aged 18–64 years were self-employed in September 1989 (Statistik der Deutschen Demokratischen Republik 1990), just before the socialist German Democratic Republic collapsed. This number, at that time,

constituted less than 20% of the number of self-employed West Germans (Fritsch et al. 2014).

Compared to other countries of the socialist block, the transformation process in East Germany was much faster and much more radical (Brezinski and Fritsch 1995). Due to the rapid unification with West Germany, the institutional framework of a western-type market economy became effective almost overnight. This "shock" transformation induced massive structural change accompanied by an almost complete replacement of incumbent firms over a short period of time. These developments led to a massive drop of manufacturing employment in East Germany from 48.7% in 1989 to 16.0% 2 years later (Hall and Ludwig 1995). As a result, the unemployment rate increased from virtually zero to more than 15% in 1992 which makes the East German transition one of the most dramatic episodes of economic disruption and change during the relatively peaceful years of the late twentieth century (Burda and Hunt 2001, p. 1).

5.3 New Business Formation and Self-employment in East and West Germany During the Transformation Process

The opening of markets and the switch to a market economic system in 1990 induced a start-up boom in East Germany that clearly demonstrated the willingness of many East Germans to be self-employed. According to the German Micro-Census,[3] the self-employment rate (the share of self-employed persons over the working population aged between 18 and 65 years) rose from about 1.8% at the end of the socialist period in 1989 to more than 5% in 1991 (Fig. 5.1).[4] During the 1990s, the self-employment rate in East Germany grew rapidly and reached the West German level in 2004. This equalization of the self-employment levels in East and West Germany is in line with Baumol's (1990) claim that the character of the institutional framework is a main determinant of the level of productive entrepreneurship in a society.

A likely reason for the persistently high level of new business formation in East Germany (Fig. 5.2) could be the relatively high unemployment rate that may have resulted in many businesses being started up "out of need" (necessity entrepreneurship). One indication that unemployment was indeed having this effect, is the peak of new business formation around the year 2005 that is presumably due to the labor market reforms and the massive extension of public support for start-ups by unemployed people, as well as aggressive promotion of entrepreneurship as a career option (for details, see Caliendo and Kritikos 2010). Although there was a relatively

[3]The German Micro-Census, conducted by the Federal Statistical Office, has a general sampling fraction of 1% of the total population living in Germany, providing information for 820,000 individuals in each wave (Statistisches Bundesamt 2009).

[4]This rise in the self-employment rate is slightly overestimated because of the decreasing employment rate, which is the denominator of the self-employment rate.

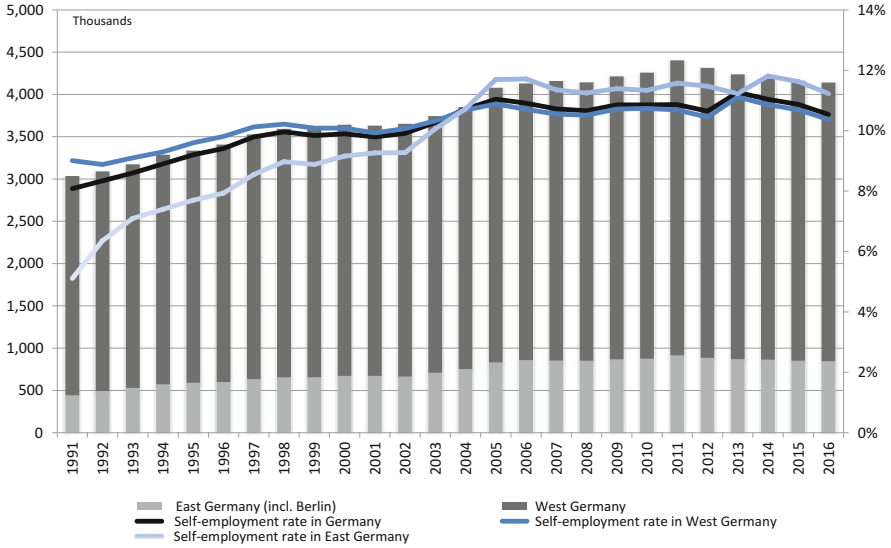

Fig. 5.1 Self-employed individuals, absolute numbers and self-employment rates, 1991–2016 (Source: own calculations based on the German Micro-Census)

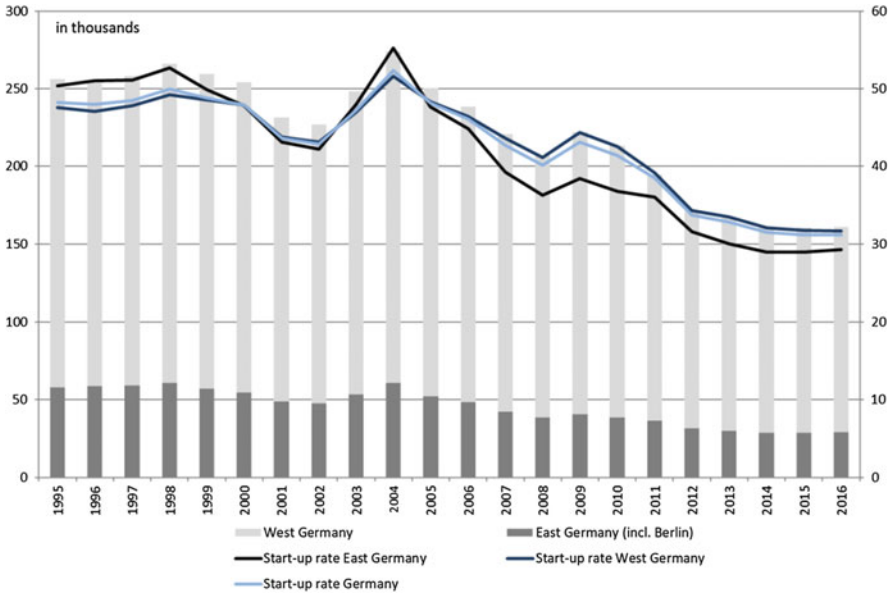

Fig. 5.2 Entries into self-employment, absolute numbers and start-up rates, 1995–2016 (Source: ZEW-Firm Panel)

large number of start-ups in East Germany during this period, the new firms were, on average, smaller (for details, see IWH 2010) and less successful when compared to their West German counterparts (Brixy and Grotz 2004; Fritsch 2004). It is also remarkable that a relatively high share of the newly emerging businesses in East Germany were in industries such as retailing, hospitality and catering, which are characterized by low entry barriers in terms of financial resources and required qualifications (for details, see Fritsch et al. 2012).

5.4 Differences in the Personal Determinants of Start-ups in East and West Germany

There are good reasons to assume that East Germany's socialist legacy negatively affected its people's attitudes toward entrepreneurship, and both their willingness and ability to start an own firm. One source of such a negative effect is the implied reduction of opportunities for contact with entrepreneurial role models caused by the sharp decrease in entrepreneurship during the socialist regime. A second potential source of such an effect could have come from the massive anti-capitalistic propaganda campaigns, especially indoctrination of young people in their educational programs. This propaganda may have resulted in negative attitudes towards entrepreneurship, thereby reducing the willingness of East Germans to become self-employed (Bauernschuster et al. 2012; Fritsch and Rusakova 2012). Third, since East Germans had relatively few incentives or opportunities to accumulate financial capital, they had, on average, much fewer available resources than their West German counterparts. Fourth, people who were educated and worked in a socialist centrally planned economy may lack certain skills that are necessary for, or at least conducive to, successful entrepreneurship. Thus, there are a number of potential reasons that explain the rather low levels of self-employment rates in East Germany directly after German unification.

Given the rapid convergence of entrepreneurial activities in East Germany to West Germany's level, it appears that over time more East Germans were able to access the resources required to begin an own business venture. Because a western style market economy was introduced in East Germany directly after the fall of the Berlin Wall, Baumol's (1990) argument that certain types of entrepreneurs are more likely to be active in a given institutional framework would lead us to expect few pronounced differences in the personal characteristics of East and West German business founders. Hence, the analysis of individual-level determinants of entrepreneurial choice in East and West Germany may provide further insights into the role an institutional framework plays in supporting entrepreneurship.

We use data from the German Socio-Economic Panel (SOEP), a representative and well-accepted yearly household survey in Germany (for a description of the data, see Wagner et al. 2007), for our investigation of the differences between East and West Germans with regard to their decision to start an own business or not. The

analysis is based on the waves 1999–2014 of the SOEP. We exploit the panel character of the data and perform random effects probit analyses. We do not apply the fixed effects panel technique because a number of the independent variables show no, or merely small changes over time, using this method would assign considerable parts of their influence to the fixed effects. The dependent variable assumes the value 1 if a person has set up an own business in the year of the interview and equals zero otherwise.[5] Independent variables that may be relevant for the decision to start an own business (see Parker 2009a, for an overview) and for which the SOEP provides information are age, years of formal education, gender, marital status, gross labor income and the share of time in unemployment in the total time of labor market experience. We interacted all individual control variables with a dummy indicating an East German respondent.[6] The right column in Table 5.1 displays the interaction effect, while the left column shows the main effect, which represents the coefficient estimate for West German respondents. Statistical significance of an interaction effect means that there is a difference in the effect size for East Germans. Insignificance of the interaction term indicates equal effect size of the respective control variable for East and West German respondents.

We find a positive effect of the time spent in unemployment in the overall labor market experience. In accordance with the majority of previous analyses (see Parker 2009b), males are more likely to become self-employed than females in both East and West Germany. There is also the usual inverted U-shape relationship between age and self-employment. With the exception of marital status, the interaction effects for East German persons are not statistically significant (Table 5.1). This indicates that the characteristics of founders in East and West Germany are rather similar (Table 5.1). Hence, under the identical framework of formal institutions, roughly the same types of individuals chose the employment option of productive entrepreneurship. This finding may be regarded as further confirmation of Baumol's (1990) hypothesis.

Although the analysis does not reveal any significant interaction effects between a respondent's age and his or her propensity to become self-employed, we might find some revealing differences if we focus on the East German age cohorts. Considering that older East Germans spent a longer period of time being indoctrinated by the socialist regime and had longer exposure to massive anti-capitalistic propaganda campaigns, one might expect a lower propensity among this age group to engage in entrepreneurial activity. Working in a centrally planned economic system they had little opportunity to gain knowledge about the functioning of a market economy and, quite frequently, a considerable part of the work experience that they had acquired under socialism turned out to be useless in the newly emerging system (Bird et al.

[5]The sample is restricted to employed individuals between 18 and 65 years of age. Civil and military servants as well as helping family members are excluded from the analysis.

[6]Respondents are assigned to East and West Germany if they lived in the respective part of the country at the time of the survey and before German unification in 1990. Hence, we exclude respondents who moved from the East to the West and vice versa.

Table 5.1 The impact of personal characteristics on the probability of start-up in East and West Germany over time

Dependent variable: Probability to start-up a firm (Y = 1)	West	East (interaction effects)
East German origin (1 = yes, 0 = no)	−0.003	
	(0.023)	
Age (years)	0.001**	0.001
	(0.000)	(0.001)
Age (years), squared	−0.000**	−0.000
	(0.000)	(0.000)
Years of formal education	0.000	−0.002
	(0.002)	(0.003)
Years of formal education, squared	0.000	0.000
	(0.000)	(0.000)
Male (1 = yes, 0 = no)	0.002**	0.003
	(0.001)	(0.003)
Married (1 = yes, 0 = no)	−0.001	0.003*
	(0.001)	(0.001)
Gross labor income (log) (t − 1)	−0.003***	−0.000
	(0.001)	(0.001)
Share of time unemployed in total labor market experience	0.005**	0.001
	(0.002)	(0.001)
Year Dummies	Yes***	
Log pseudo likelihood	−1094.296	
Wald chi2	71.00***	
Number of observations	42,043	

Notes: Dependent variable: Founded a firm in the respective time-period, yes = 1, no = 0. Random effects probit analyses. Marginal effects are shown; robust standard errors in parentheses. ***: statistically significant at the 1% level; **: statistically significant at the 5% level; *: statistically significant at the 10% level

1994; Gathmann 2005; Wyrwich 2013). Older West Germans, however, had more time to recognize and act on entrepreneurial opportunities, as well as to accumulate the resources necessary for starting an own business. In order to investigate the presence of such an age effect we analyze the probability of being self-employed among different age groups based on the SOEP.

We analyze the probability of self-employment for relatively young and relatively old people between 1999 and 2014 in order to detect whether age-related effects decrease over time (Table 5.2). The analysis shows that there is no East-West difference for those SOEP respondents who are younger than 40 years old while there is a strong negative East effect among older respondents. Thus, it appears to be the older East Germans who are particularly underrepresented in entrepreneurship.[7] The results on control variables resemble those of Table 5.1.

[7]Findings of a related study (Wyrwich 2013) show that the negative origin effects among East Germans are more pronounced for self-employed people with dependent employees than for solo

Table 5.2 Analyses of determinants of self-employment over time[a]

Dependent variable: Probability to be self-employed (Y = 1)	Age (years)	
	18–39	40–65
East German origin (1 = yes, 0 = no)	0.000	−0.014***
	(0.003)	(0.004)
Age (years)	0.007*	0.023***
	(0.004)	(0.005)
Age (years), squared	−0.000	−0.000***
	(0.000)	(0.000)
Years of formal education	0.008	0.013
	(0.008)	(0.009)
Years of formal education, squared	−0.000	−0.000
	(0.000)	(0.000)
Male (1 = yes, 0 = no)	0.017***	0.034***
	(0.003)	(0.004)
Married (1 = yes, 0 = no)	−0.005	−0.001
	(0.003)	(0.005)
Share of time unemployed in total labor market experience	−0.027***	−0.051*
	(0.009)	(0.031)
Year Dummies	Yes	Yes
Log pseudo likelihood	−2957.3114	−4051.8741
Wald Chi2	177.77***	199.64***
Number of observations	28,779	41,006

[a]The case number is stronger than in Table 5.1 because it is not controlled for gross labor income, which often has missing values. It does not make sense to include this control in this table because being self-employed (dependent variable) affects income

Notes: Dependent variable: Self-employment status (yes = 1, no = 0). Probit analyses. Marginal effects are shown; robust standard errors in parentheses. ***: statistically significant at the 1% level; **: statistically significant at the 5% level; *: statistically significant at the 10% level

The results of our analysis on the relationship between age and entrepreneurship suggest that the socialist legacy left an imprint on East Germans, even though the levels of entrepreneurship in East and West have become quite similar. Hence, the distinctiveness of entrepreneurship in post-socialist East Germany is not limited to entrepreneurial choice but also pertains to entrepreneurial success. Analyses of the survival of new businesses in East and West Germany show a higher risk of failure for start-ups in East Germany (Brixy and Grotz 2004). It is interesting to note that of the surviving East German start-ups, the businesses that tend to have a stronger growth rate are those that have West German involvement (Wyrwich 2010). It is not hard to imagine that this is another indication that 40 years of a socialist legacy had a

self-employment. This result is remarkable because such differences in the probability of self-employment cannot be solely explained with an effect of East German origin. Additionally, there must be other reasons.

negative impact on the relevant entrepreneurial abilities of many East Germans founders.

Further differences between people in East and West Germany are found when analyzing the diversity and structure of their skills. According to the theory of "balanced skills" (Lazear 2004, 2005), entrepreneurs are generalists who need a variety of skills to run a business. Furthermore, the skills should be "balanced" because the successful starting of a firm may depend on whether the weakest skill becomes a bottleneck and in turn may shape the propensity to start up. Empirical analyses show that East Germans have, on average, less diversified skill sets, and a significantly lower number of expert skills than their West German counterparts (Fritsch et al. 2014). The less diversified skill sets of East German entrepreneurs contribute to explaining the lower performance of East German firms. Most employees in socialist economies (such as that found in East Germany) required a low skill set because their jobs had a high degree of specialization and they had little opportunity to change jobs (see, e.g., Hitchens et al. 1993, 1995). Thus, the on average lower skill balance of East Germans may be regarded another legacy of the socialist regime. Moreover, even after German unification a large number of East German firms became branches of West German companies that often used the East German branch as an "extended work bench" where the employees needed relatively few skills.

5.5 Regional Differences in Entrepreneurship

Looking at the regional distribution of self-employment, we find significant differences, indicating that region-specific factors play a prominent role. In fact, even in September 1989, after 40 years of socialist regime and just before the East German transition to a market economic system, there were significant regional differences with regard to the share of self-employed people in the GDR. At that time, the self-employment rate varied between 0.4% and 3.2% (Fig. 5.3). Specifically, regions in the southern part of East Germany such as Chemnitz, Zwickau, and Dresden had a considerably above average level of self-employment, whereas self-employment rates were especially low in regions with a high employment share in agriculture and in those areas where local industry was strongly shaped by socialist industrial policy and regional planning (e.g., Bitterfeld, Eisenhuettenstadt, Hoyerswerda, and Schwedt; for details see Wyrwich 2012, 2014).

A comparison of self-employment rates on the eve of the East German transition to a market economy with the respective shares of self-employment in the years 1907 and 1925 shows a high degree of correspondence.[8] The positive relationship between the self-employment rate in 1907 and 1925 is particularly pronounced in those regions in the south of East Germany that show high levels of self-employment

[8]For the definition of the historical self-employment rates see Sect. 3.2.1.

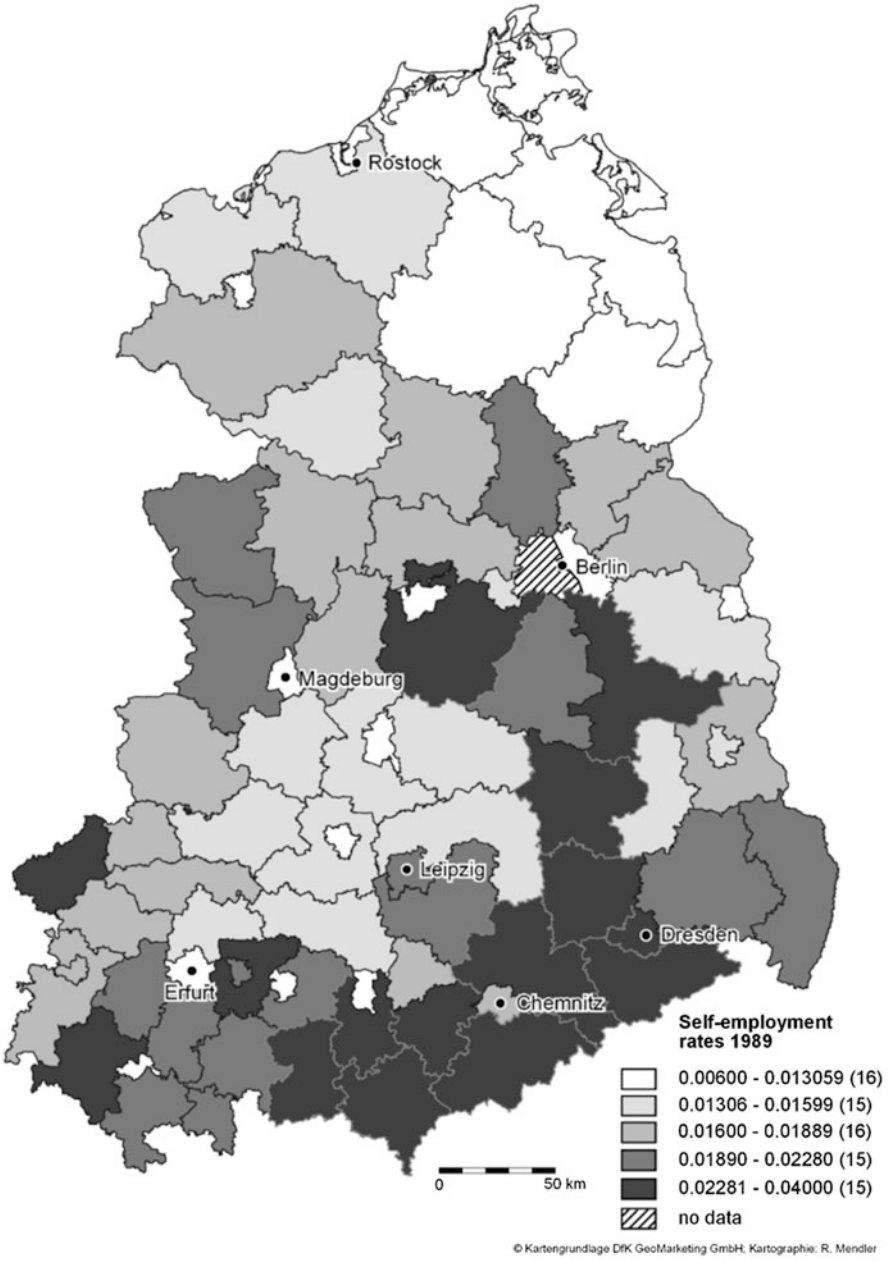

Fig. 5.3 Regional differences of self-employment in the GDR in 1989 (Source: own calculations on the basis of official GDR statistics, Statistik der Deutschen Demokratischen Republik 1990)

in 1989, even when we control for regional conditions such as population density, the share of employees with tertiary education, and share of manufacturing employment (Table 5.3). This suggests that the regional levels of self-employment that still existed at the end of the GDR era have historical roots. It is also quite remarkable that even when we include home workers (*Heimgewerbetreibende*) in the historical self-employment rates, we still see a positive effect.

Since the rigorous anti-entrepreneurship policies implemented during the GDR era largely prevented any new entries of private firms, the regional variation in private-sector activity in 1989 can be regarded as a result of different levels of resistance to political attempts to abolish private firms. Hence, on the eve of the transition to a market economy, there was considerable variation across East German regions with regard to self-employment or, in other words, an entrepreneurial culture. Thus, our result suggests that a number of severe historical shocks—such as World War II and separation of the country into an eastern and a western part, as well as four decades of socialism—could not completely eradicate the regional culture of entrepreneurship that existed in the pre-socialist period.

However, as previously mentioned, the scope of private sector activities varied across sectors. During the GDR era, it was particularly manufacturing trades and handicrafts where self-employment was allowed. Indeed, the effect of self-employment in 1925 is even more pronounced when restricting the measure to the manufacturing sector (Table 5.3). On the one hand, self-employment in manufacturing may require a higher level of entrepreneurial ability to overcome entry barriers compared to, for example, a business in small-scale services. Thus, self-employment in manufacturing might be an especially well-suited indicator of the historical geography of entrepreneurial talent and culture. On the other hand, if self-employment in the GDR was restricted specifically to manufacturing trades, then this more noticeable effect may also capture the notion that in areas with high pre-socialist shares of manufacturing more self-employment could be preserved. So, the coefficient estimate may not only capture a cultural component but also a sector-specific effect. Be as it may, we can conclude that self-employment has survived the socialist period, especially in those regions that had an entrepreneurial tradition in the manufacturing sector before the socialist GDR regime came into existence.[9]

Data on start-up activity is obtained from the Foundation Panel of the Centre for European Economic Research (Zentrum für Europäische Wirtschaftsforschung, ZEW) in Mannheim (for details, see Almus et al. 2002; Bersch et al. 2014). This dataset provides the most reliable information on East German start-up activities in

[9]It should be also noted that the employment share in manufacturing in 1989 correlates positively with the self-employment rate. A high manufacturing share in 1989 mirrors a high pre-socialist specialization in manufacturing. The share of highly skilled employees relates negatively to the self-employment rate in 1989. One main reason may be the strong anti-entrepreneurial indoctrination at universities. As previously mentioned, the ideological conditioning of university graduates was supported by a pronounced tendency to admit only those persons to higher education that declared conformity with socialist values (see Connelley 2000; Fritsch and Rusakova 2012).

Table 5.3 Regression analysis on self-employment rates across East German regions in 1989

Dependent variable: Self-employment rate 1989	I	II	III	IV	V	VI
Share of self-employed in non-agricultural private sectors in total employment 1907	0.413***					
	(0.130)					
Share of self-employed in manufacturing industries in total employment 1907		0.354***				
		(0.0980)				
Share of self-employed in non-agricultural private sectors in total employment 1925			0.170			
			(0.375)			
Share of self-employed in manufacturing industries in total employment 1925				0.551**		
				(0.252)		
Share of self-employed (incl. home workers) in non-agricultural private sectors in total employment 1925					0.380**	
					(0.177)	
Share of self-employed (incl. home workers) in manufacturing industries in total employment 1925						0.383***
						(0.113)
Share of highly skilled employees 1989	−0.300**	−0.279**	−0.358**	−0.362***	−0.359***	−0.299**
	(0.137)	(0.137)	(0.141)	(0.126)	(0.130)	(0.131)
Share of manufacturing employment 1989	0.300**	0.240*	0.429***	0.351***	0.329**	0.219*
	(0.127)	(0.132)	(0.126)	(0.130)	(0.132)	(0.125)
Dummies for type of region (n = 7)	Yes***	Yes***	Yes***	Yes**	Yes***	Yes***
Constant	−3.856***	−3.734***	−4.284***	−3.024***	−3.962***	−3.598***
	(0.423)	(0.407)	(0.781)	(0.823)	(0.464)	(0.442)
F-Value	6.87***	7.31***	4.58***	6.43***	6.02***	6.64***
$R^{2\ adj}$	0.340	0.351	0.270	0.323	0.309	0.361

Notes: OLS regressions. Robust standard errors in parentheses. ***: statistically significant at the 1% level; **: statistically significant at the 5% level. NUTS 3 regions (districts = Kreise, n = 72). Some districts had to be merged because it was not possible to assign historical data adequately to these districts separately. All continuous variables are log-transformed

the early 1990s on a regional basis (see Sect. 3.2.2 for details). The data show that the level of new business formation in East Germany during the transition process also shows great variation across regions (Fig. 5.4). Particularly high levels of new business formation can be found in regions adjacent to Berlin and in larger cities such as and similar to Dresden, Chemnitz and Leipzig. Start-up rates tend to be rather low in rural regions and in places strongly shaped by socialist economic policies, such as Bitterfeld and Hoyerswerda.[10]

In Tables 5.4 and 5.5 we regress start-up activity in different years on historical self-employment rates. In contrast to the analyses in Chap. 4, we include initial conditions in September 1989 and run the analysis at the level of districts.[11] We are also able to consider the year 1990 by referring to the data of the ZEW and by measuring the start-up rate as number of start-ups over population of working age. The analysis shows that the historical self-employment rates in 1907 and 1989 have a positive effect on start-up activity after transition.[12]

Our additional analyses reveal some remarkable trends over time. The effect size for the self-employment rates found in 1907 and 1989 is relatively similar for the early transition period (1990–1994). The effect of the self-employment rate found in 1989 decreases slightly as time goes on, while the coefficient for the self-employment rate found in 1907 increases after the year 2000. This pattern is astonishing because one would expect that the effect of a variable would decrease the more distant it is from the observation period. One obvious explanation for this pattern is that start-up activity in the early years after re-unification was marked by transition-specific effects that are hard to capture ("transition noise"). After these specific effects vanished, the effect of historically grown entrepreneurship culture became more dominant.[13] Vanishing transition effects that are difficult to capture, may also explain that the explanatory power of the regression models increases the more distant the observation period. The share of highly skilled employees has a positive effect in these estimates. This finding, however, is not robust.[14] Altogether, the overall pattern corresponds to our findings that East Germans who hold a university degree have a relatively low propensity to start a business (Sect. 5.3).

The results for the historical self-employment rates indicate that a comparatively high level of self-employment can have an enduring influence on start-up activity despite tremendous ruptures of the economic and political environment, such as two World Wars, the division of Germany into two separate states, four decades of a

[10]The high start-up rates in the north (e.g. in the Rostock area) are presumably due to the privatization of the formerly state-owned tourism industry.

[11]Additionally we include dummy variables for the type of region based on the settlement structure (urbanization and centrality) as classified by the Federal Institute for Research on Building, Urban Affairs and Spatial Planning (BBSR).

[12]There is a similar pattern when employing the year 1925.

[13]At the same time, the decrease in the coefficient estimate for the self-employment rate found in 1989 indicates that there are components other than culture that are measured by this variable.

[14]The coefficient estimate becomes insignificant when employing the self-employment rate found in 1925 as the indicator for historical entrepreneurship culture.

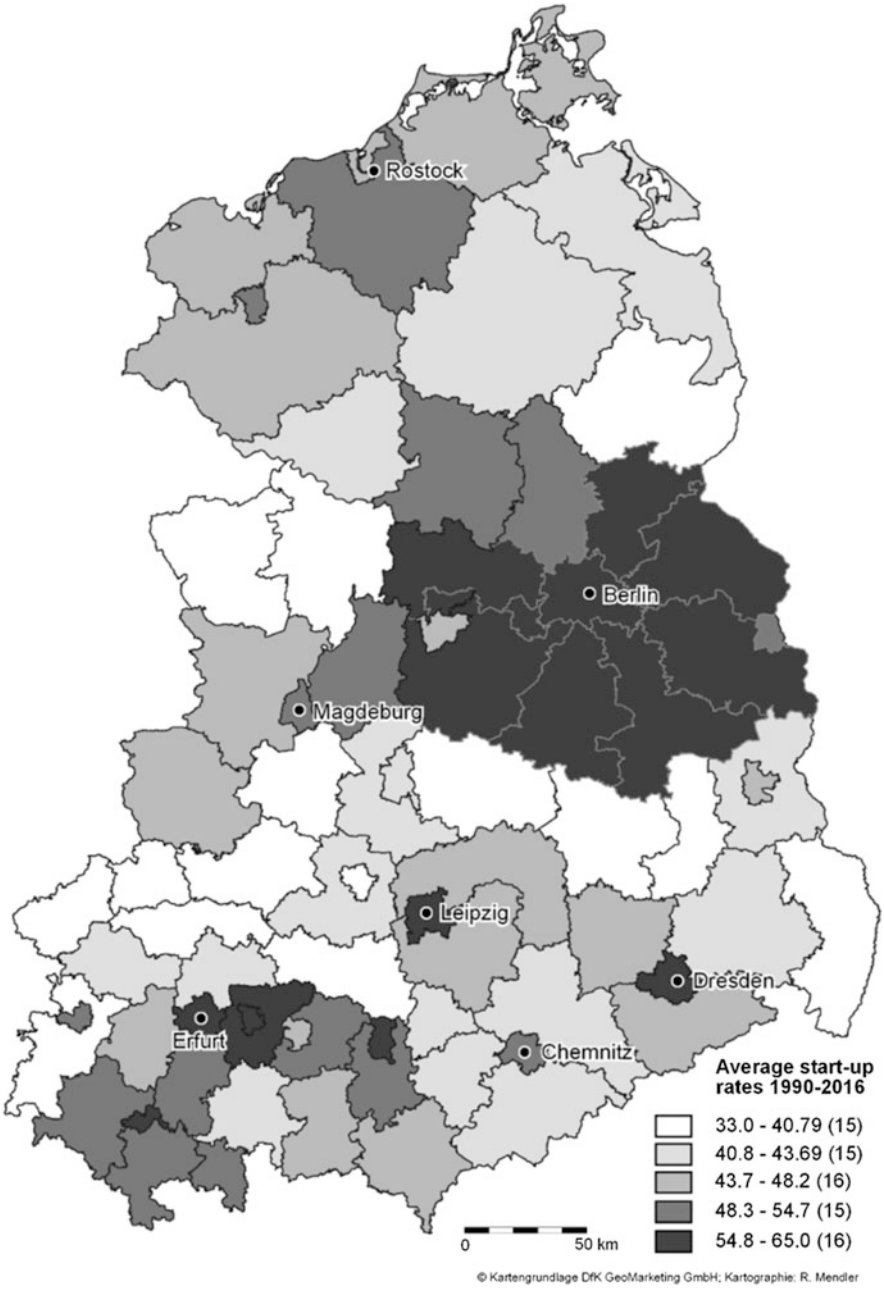

Fig. 5.4 Average number of start-ups between 1990 and 2016 per 1000 inhabitants between 20 and 64 years old

Table 5.4 Regression analyses of the effect of historical self-employment rates on self-employment rates in East Germany after the regime switch: 1990–1999

	I	II	III	IV	V	VI
Dependent variable: Start-up rate	1990		Average 1990–1994		Average 1995–1999	
Share of self-employed in non-agricultural private sectors in total employment 1907	0.242		0.214**		0.351***	
	(0.157)		(0.0895)		(0.107)	
Self-employment rate 1989		0.268***		0.227***		0.253**
		(0.0806)		(0.0586)		(0.106)
Share of highly skilled employees 1989	0.137**	0.193**	0.125***	0.171***	0.174**	0.219***
	(0.0677)	(0.0886)	(0.0455)	(0.0511)	(0.0707)	(0.0558)
Share of manufacturing employment 1989	−0.178	−0.0994	−0.180*	−0.113	−0.276**	−0.185
	(0.127)	(0.146)	(0.104)	(0.111)	(0.113)	(0.144)
Dummies for type of region (n = 7)	Yes	Yes	Yes	Yes	Yes	Yes
Federal State Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Location at the border of West Germany (1 = yes)	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***
Constant	−3.764***	−2.901***	−4.126***	−3.416***	−4.174***	−3.608***
	(0.384)	(0.492)	(0.204)	(0.321)	(0.262)	(0.535)
F-Value	2.74***	4.24***	4.68***	5.70***	10.11***	15.43***
$R^{2\ adj}$	0.294	0.327	0.371	0.410	0.491	0.469

Notes: OLS regressions. Robust standard errors in parentheses. ***: statistically significant at the 1% level; **: statistically significant at the 5% level. NUTS 3 regions (districts = Kreise, n = 72). Some districts had to be merged because it was not possible to assign historical data adequately to these districts separately. All continuous variables are log-transformed

Table 5.5 Regression analyses of the effect of historical self-employment rates on self-employment rates in East Germany after the regime switch: 2000–2014

	I	II	III	IV	V	VI
Dependent variable: Start-up rate	Average 2000–2004		Average 2005–2009		Average 2010–2014	
Share of self-employed in non-agricultural private sectors in total employment 1907	0.265***		0.273***		0.305***	
	(0.0962)		(0.0759)		(0.0702)	
Self-employment rate 1989		0.196*		0.191**		0.180**
		(0.102)		(0.0817)		(0.0808)
Share of highly skilled employees 1989	0.0723	0.108**	0.0697	0.103***	0.181***	0.210***
	(0.0711)	(0.0519)	(0.0505)	(0.0371)	(0.0441)	(0.0488)
Share of manufacturing employment 1989	−0.313**	−0.244*	−0.226**	−0.156	−0.219**	−0.146
	(0.120)	(0.142)	(0.100)	(0.129)	(0.0856)	(0.115)
Dummies for type of region (n = 7)	Yes	Yes	Yes	Yes	Yes	Yes
Federal State Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Location at the border of West Germany (1 = yes)	Yes***	Yes***	Yes***	Yes***	Yes***	Yes***
Constant	−4.696***	−4.242***	−4.816***	−4.410***	−4.812***	−4.523***
	(0.245)	(0.496)	(0.224)	(0.418)	(0.191)	(0.425)
F-Value	7.99***	9.61***	6.66***	8.23***	9.49***	7.47***
$R^{2\ adj}$	0.524	0.513	0.503	0.477	0.541	0.494

Notes: OLS regressions. Robust standard errors in parentheses. ***: statistically significant at the 1% level; **: statistically significant at the 5% level. NUTS 3 regions (districts = Kreise, n = 72). Some districts had to be merged because it was not possible to assign historical data adequately to these districts separately. All continuous variables are log-transformed

socialist regime and the shock of transitioning to a market economic system. This suggests the presence and long-lasting persistence of a regional entrepreneurial culture that can be thought of as a 'positive collective programming of the mind' (Beugelsdijk 2007, p. 190), or an 'aggregate psychological trait' (Freytag and Thurik 2007, p. 123) of the population oriented towards entrepreneurial values such as individualism, independence and achievement.

The results of our analyses of self-employment in the GDR suggest that in some areas individuals were more resistant to the anti-entrepreneurship policies of the socialist government than in other areas. Indeed, data on the proportion of craftsmen who joined socialist handicraft cooperatives (*Produktionsgenossenschaften des Handwerks* = PG) show lower shares in regions with a pronounced entrepreneurial tradition (Wyrwich 2012). Furthermore, empirical evidence indicates that there was a considerable degree of intergenerational continuity in self-employment in the GDR (Pickel 1992). Thus, entrepreneurial attitudes might have been passed on across generations leading to persistence of self-employment and the survival of a regional entrepreneurial culture.

5.6 Summary and Conclusions

Our analyses of self-employment in East Germany after 40 years of a socialist regime lead to several remarkable results. Self-employment and entrepreneurship in East Germany—after having been suppressed for a significant period of time—seem to have recovered. In particular, we found considerable support for Baumol's (1990) hypothesis that the allocation of people into productive entrepreneurship is strongly shaped by the ruling formal institutions. However, after the rapid introduction of the formal institutional framework of a market economy, it took a period of about 15 years before the East German self-employment rate reached the West German level.

Forty years of socialism, as well as the subsequent shock transformation to a market economy have, however, left their marks on East Germany. Socialization and work experience in a centrally planned socialist economy had a negative effect on the propensity to found an own business that can be particularly identified among older and better-educated East Germans. We also find that East Germans tend to have fewer skills than their West German counterparts, which may be the consequence of the type of work organization that prevailed in the socialist economy. This lower skill variety may have a negative effect on the propensity to start-up and, possibly, also on the success of a newly founded business. There is also a strong indication that the high unemployment rates during the East German transformation to a market economy led to a relatively high share of start-ups that were primarily motivated by necessity. These results indicate that the socialist legacy, as well as the subsequent shock transformation, resulted in a specific kind of regional growth

regime in which the drivers of growth differ from those in the western part of the country (Audretsch and Fritsch 2002; Fritsch 2004).[15]

Another important finding from our analyses is that regional differences in the level of self-employment seem to be rather persistent over long periods of time. Specifically, we are able to show a significantly positive relationship between the current regional self-employment rate, the self-employment level at the end of the GDR era in 1989, and the level of self-employment prior to World War II. This indicates a long-lasting regional imprinting that is able to survive harsh external shocks such as fundamental changes of the formal institutional framework, and may be regarded as a regional culture of entrepreneurship. We are able to show that the effect of the socialist legacy differed according to the strength of such a regional entrepreneurship culture. This is not in contradiction to Baumol's (1990) hypothesis, but demonstrates the important role of informal institutions—such as a culture of entrepreneurship—that tends to change very slowly and is considerably more persistent than formal rules (North 1994; Williamson 2000).

Our analysis raises a number of questions that should be investigated in future research. One of these issues is an analysis of the regional dimension of new business formation in other former socialist Eastern European transition countries. Do other Eastern European countries transitioning out of a former socialist regime display similar regional patterns of new business formation? Can start-up activity in other post-socialist countries also be explained by pre-socialist conditions? A study by Becker et al. (2016) provides evidence for such a long-term persistence of informal institutions in these countries. The authors compare Eastern European regions with and without affiliation to the Habsburg Empire. They show that having been a part of the Habsburg Empire in the past relates to higher levels of trust among the population today with a lower degree of corruption of police and courts.

Analyzing such patterns requires a better understanding of long-lasting imprints, such as a culture of entrepreneurship. What creates such a culture? How does it emerge and evolve? How is it transferred across generations? A particularly important question has to do with the effect of a long established and persistent culture of entrepreneurship on economic development. Our analyses show that regions with high historic levels of self-employment tend to have high levels of self-employment today, and transitioned more quickly to active entrepreneurship during the transformation process. This might be an indication that these entrepreneurial regions also managed the other challenges of the transformation process quite well (Kawka 2007). However, further research is necessary before we can definitively answer this important question. Fortunately, past and continuing developments in East and West Germany provide many opportunities for further analyses of such questions.

[15] Another aspect of a socialist legacy in East Germany is the performance of the economy. Despite massive policy support and subsidization, most East German firms still have enormous problems when competing on international markets. More than 20 years after the beginning of the transformation process the average level of labor productivity amounts to only about 80% of the West German level.

Appendix

Table 5.6 Summary statistics: Survey data analysis

	Mean	Standard deviation	Minimum	Maximum
Starting up a firm (Yes = 1)	0.01	0.098	0	1
Being self-employed (Yes = 1)	0.066	0.248	0	1
East German origin (Yes = 1)	0.398	0.489	0	1
Age (years)	41.368	12.858	18	64
Years of formal education	12.288	2.491	7	18
Share of time unemployed in total labor market experience	0.082	0.175	0	1
Married (Yes = 1)	0.57	0.495	0	1
Female (Yes = 1)	0.524	0.499	0	1
Gross labor income (log) ($t - 1$)	2199.164	1489.63	0	21,500

Table 5.7 Summary statistics: Regional analysis

	Mean	Standard deviation	Minimum	Maximum
Start-up rate	47.549	25.137	14.168	237.018
Share of self-employed in non-agricultural private sectors in total employment 1907	0.138	0.034	0.075	0.26
Share of self-employed in manufacturing industries in total employment 1907	0.079	0.029	0.032	0.203
Share of self-employed in non-agricultural private sectors in total employment 1925	0.104	0.014	0.071	0.152
Share of self-employed in manufacturing industries in total employment 1925	0.05	0.007	0.034	0.07
Share of self-employed (including home workers) in non-agricultural private sectors in total employment 1925	0.118	0.027	0.072	0.251
Share of self-employed (including home workers) in manufacturing industries in total employment 1925	0.064	0.026	0.035	0.202
Self-employment rate 1989	0.018	0.005	0.007	0.03
Share of highly skilled employees 1989	0.066	0.03	0.037	0.204
Share of manufacturing employment 1989	0.457	0.099	0.241	0.656

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